

WHAT IS CLAIMED IS:

1 1. A vacuum cleaning machine comprising a cannister having an inlet
2 port and at least two outlet ports, at least two filters disposed inside of said
3 cannister, one in pneumatic communication through a corresponding one of each
4 of said outlet ports, a vacuum source, at least two valves disposed outside of said
5 cannister, each said valve being in pneumatic communication between said vacuum
6 source and a corresponding one of each of said outlet ports and permitting air to be
7 drawn by said vacuum source from said inlet port simultaneously through
8 corresponding ones of said filters and means for sequentially operating said valves
9 to switch said filters from connection to said vacuum source to connection to
10 ambient air and permitting ambient air to be intermittently drawn through
11 corresponding ones of said valves and said filters into said cannister.

1 2. A vacuum cleaning machine according to claim 1 further comprising
2 means cooperable with said inlet port to divide said cannister into an upper zone of
3 high velocity vortex air flow and a lower zone of reduced velocity air flow.

1 3. A vacuum cleaning machine according to claim 2, said inlet port being
2 disposed below said filter and above a bottom of said cannister and said cooperable
3 means comprising a duct directing air flow downwardly in said cannister from said
4 inlet port and a baffle redirecting said downward flow to a circumferential flow.

1 4. A vacuum cleaning machine according to claim 1, said operating
2 means having means for setting a cycle time of said sequential valve operation.

1 5. A vacuum cleaning machine according to claim 1, said operating
2 means having means for setting said intermittent time of connection to ambient air
3 for each said filter.

1 **6.** A vacuum cleaning machine according to claim **1**, said operating
2 means having means for setting a cycle time of said sequential valve operation and
3 means for setting said intermittent time of connection to ambient air for each said
4 filter.

1 **7.** A vacuum cleaning machine according to claim **1**, each said valve
2 comprising a housing having a continuously open port and two reciprocally opened
3 and closed ports therethrough, a piston reciprocally disposed between said two
4 ports and means biasing said piston to simultaneously close one of said two ports
5 and open another of said two ports.

1 **8.** A vacuum cleaning machine according to claim **7**, said operating
2 means further comprising means for overcoming said bias to move said piston to
3 simultaneously open said one of said two ports and close said another of said two
4 ports.

1 **9.** A vacuum cleaning machine according to claim **8**, said bias
2 overcoming means comprising at least two solenoids, one corresponding to each
3 said valve, and means for energizing said solenoids to switch said valves to connect
4 said filters to ambient air and for de-energizing said solenoids to switch said valves
5 to connect said filters to said vacuum source.

1 **10.** A vacuum cleaning machine comprising a cannister having an inlet
2 port and three outlet ports, three filters disposed inside of said cannister, one in
3 pneumatic communication through a corresponding one of each of said outlet ports,
4 a vacuum source, three valves disposed outside of said cannister, each said valve
5 being in pneumatic communication between said vacuum source and a
6 corresponding one of each of said outlet ports and permitting air to be drawn by
7 said vacuum source from said inlet port simultaneously through corresponding ones
8 of said filters and means for sequentially operating said valves to switch said filters
9 from connection to said vacuum source to connection to ambient air whereby
10 ambient air is intermittently drawn sequentially through corresponding ones of said
11 valves and said filters into said cannister.

1 **11.** A vacuum cleaning machine according to claim **10** further comprising
2 means cooperable with said inlet port to divide said cannister into an upper zone of
3 high velocity vortex air flow and a lower zone of reduced velocity air flow.

1 **12.** A vacuum cleaning machine according to claim **11**, said inlet port
2 being disposed below said filter and above a bottom of said cannister and said
3 cooperable means comprising a duct directing air flow downwardly in said cannister
4 from said inlet port and a baffle redirecting said downward flow to a circumferential
5 flow.

1 **13.** A vacuum cleaning machine according to claim **10**, said operating
2 means having means for setting a cycle time of said sequential valve operation.

1 **14.** A vacuum cleaning machine according to claim **10**, said operating
2 means having means for setting said intermittent time of connection to ambient air
3 for each said filter.

1 **15.** A vacuum cleaning machine according to claim **10**, said operating
2 means having means for setting a cycle time of said sequential valve operation and
3 means for setting said intermittent time of connection to ambient air for each said
4 filter.

1 **16.** A vacuum cleaning machine according to claim **10**, each said valve
2 comprising a housing having a continuously open port and two reciprocally opened
3 and closed ports therethrough, a piston reciprocally disposed between said two
4 ports and means biasing said piston to simultaneously close one of said two ports
5 and open another of said two ports.

1 **17.** A vacuum cleaning machine according to claim **16**, said operating
2 means further comprising means for overcoming said bias to move said piston to
3 simultaneously open said one of said two ports and close said another of said two
4 ports.

1 **18.** A vacuum cleaning machine according to claim **17**, said bias
2 overcoming means comprising at least two solenoids, one corresponding to each
3 said valve, and means for energizing said solenoids to switch said valves to connect
4 said filters to ambient air and for de-energizing said solenoids to switch said valves
5 to connect said filters to said vacuum source.

1 **19.** A vacuum cleaning machine comprising a cannister having an opening
2 in a top thereof and an inlet port, a plate closing said opening, said plate having
3 three outlet ports, three filters mounted on said plate and disposed inside of said
4 cannister, one in pneumatic communication through a corresponding one of each
5 of said outlet ports, a vacuum source, three valves mounted on said plate and
6 disposed outside of said cannister, each said valve having a first port in
7 continuously open pneumatic communication with a corresponding one of said
8 outlet ports, a second port in pneumatic communication with said vacuum source
9 and a third port in pneumatic communication with a source of ambient air, a piston
10 reciprocally disposed between said second and third ports, a coil spring biasing said
11 piston to simultaneously close said third port and open said second port in a
12 vacuum mode and a solenoid for overcoming said bias and reciprocating said piston
13 to simultaneously close said second port and open said third port in a backflush
14 mode and means for operating said valves to sequentially switch said filter from
15 communication with said vacuum source to communication with ambient air for a
16 preset time.

1 **20.** A vacuum cleaning machine according to claim **19**, said operating
2 means having means for setting a cycle time of said sequential valve operation and
3 means for setting an intermittent time of connection to ambient air for said filters.